

REMARKS

Applicant expresses appreciation to the Examiner for consideration of the subject patent application. In this application, claims 1-17 are currently under consideration, while claims 18-33 have been withdrawn. This communication is in response to the Office Action mailed April 3, 2008, in which the following actions were taken:

- (1) Claims 1-17 were rejected under 35 U.S.C. § 102(b) as anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as obvious over U.S. Patent No. 6,103,112 to Sutton et al. (hereinafter “Sutton”); and
- (2) Claims 5, 6, 9, and 15 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Sutton in view of U.S. Patent No. 6,423,120 to Nickerson et al. (hereinafter “Nickerson”).

Reconsideration of the application is respectfully requested in view of the following responsive remarks. For the Examiner's convenience and reference, Applicant's remarks are presented in the order in which the corresponding issues were raised in the Office Action.

Claim Rejections - 35 U.S.C. § 102

Claims 1-17 (including independent claims 1, 9, and 10) were rejected under 35 U.S.C. § 102(b) as being anticipated by Sutton.

In order to most succinctly explain why the claims presented herein are allowable, Applicant will direct the following remarks primarily to the independent claims with the understanding that once an independent claim is allowable, all claims depending therefrom are allowable.

Sutton discloses a chromatographic apparatus in which heating or cooling is provided by either moving air from a fan or a conduction source in metal-to-metal contact with a heat conducting block in which the chromatography column and inlet tubing are embedded. See e.g. Figures 4-7 and 9. In one embodiment in Sutton, the inlet tubing is coiled in a receptacle in the heat conducting block. In another embodiment disclosed in Sutton, inlet tubing is enclosed in a labyrinth within the block. In all of these embodiments, the column is in direct thermal contact with the source of heating or cooling, so that at least some heating or cooling of the fluid occurs in the column.

In contrast, the present claims set forth methods for treating chromatographic fluid, in which fluid is passed through a short length of tubing and rapidly heated or cooled, wherein said heating or cooling occurs away from the column, so that temperature modification and chromatographic separation are each performed exclusively in different steps of the process. The apparatus disclosed by Sutton is not compatible with the methods of the present claims, in that the separation column of each Sutton apparatus is located within the temperature modification means. Therefore in Sutton the mobile phase is heated generally throughout the tube and column. As such, Sutton does not teach all of the elements required by the present independent claims 1, 9, or 10.

As Sutton fails to teach each and every element of the present independent claims 1, 9, and 10, that reference does not anticipate those claims. The same is true of claims 2-8 and 11-17, which each include the limitations of claims 1 or 10. Therefore, Applicant respectfully requests that this rejection be withdrawn.

Claim Rejections - 35 U.S.C. § 103

Claims 1-17 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Sutton alone or Sutton in view of Nickerson. Applicants submit that the present claims 1-17 are patentable over these references. Each rejection will be discussed below in turn.

Rejection over Sutton alone

In the alternative to the above rejection under § 102, the Examiner has also rejected claims 1-17 under 35 U.S.C. § 103(a) as being unpatentable over Sutton. The failure of Sutton to teach each and every element of the present claims is discussed above and Applicants hereby reassert these arguments here. In summary, the apparatus of Sutton cannot be employed in the methods claimed by Applicants. In particular, those apparatus place the separation column within the means of heating or cooling, so that heating or cooling of the mobile phase is performed in the column rather than away from it. In contrast, the present claims require that heating or cooling occur away from the separation column. Applicants submit that this limitation is neither taught nor suggested by Sutton so as to present a *prima facie* case of obviousness. Rather, the embodiments described in Sutton clearly show the column as situated within the heat

conducting block, making them incompatible with the claimed methods. In addition, Applicants maintain that the apparatus of Sutton is also unsuited to provide the rapid heating and cooling required by claims 5, 6, and 15, in that the design of the apparatus necessitates large heating/cooling blocks, which will necessarily change temperature more slowly because there is more mass to heat or cool.

Applicants also disagree with the Examiner's statements describing Sutton's teaching regarding the temperature sensor of claim 10. This claim requires a temperature sensor connected to a portion of the tube closer to the separation column than the portion to which the heating/cooling means is connected. In asserting that Sutton teaches this limitation, the Examiner has referred an embodiment shown in Figure 7 of Sutton. However, not only is the temperature sensor in that apparatus not connected to the portion of the tube recited in the claim, it is not connected to the tube at all—instead it is embedded in the heating block. Therefore it is incompatible with the claimed method. The Examiner also refers to discussion in column 14, lines 7-20 of Sutton as teaching a temperature sensor attached to the tube. It is not clear whether the Examiner is attempting to combine this teaching with that of Figure 7. Regardless, these two teachings refer to quite different apparatus, and there is no suggestion in Sutton that they could or should be combined.

The Examiner has stated that any differences between Applicants' claims and the disclosure of Sutton reside in obvious optimization of the steps in Sutton. Applicants respectfully disagree. Sutton is solely directed to disclosing certain chromatographic apparatus. As such, any implied disclosure in Sutton of methods are limited to those which could be necessarily performed by the apparatus disclosed therein. MPEP 2112.02. However, the apparatus in Sutton are not compatible with the steps of Applicants' methods. Furthermore, there is no suggestion, motivation, or reason to be found in Sutton for modifying the disclosed apparatus to make them compatible with Applicants' methods. Therefore, Applicants submit that Sutton does not support a *prima facie* case of obviousness of the pending claims, and request the withdrawal of this rejection.

Rejection over Sutton in view of Nickerson

The Examiner has rejected claims 5, 6, 9, 15 under 35 U.S.C. § 103(a) as being unpatentable over Sutton in view of Nickerson. Specifically, Nickerson is cited to provide a teaching of the rates of temperature modification required by Applicants' claims. The shortcomings of Sutton with regard to the present claims are discussed above and also apply here. Nickerson does not remedy these shortcomings.

The heater discussed in Nickerson and referred to by the Examiner involves a heater block and heater cartridge assembly typically weighing approximately 4 oz. (113 g). Col 5, lines 35-45. This is a high-mass heater that, as Nickerson points out, requires a higher energy heater to achieve "reasonable heat-up rates." However there is no teaching in Nickerson that the heater perform its function away from the separation column, as is required by the present claims. On the contrary, Nickerson discloses an arrangement in which the column is inside or closely associated with the heater. See Figure 2. Applicants reiterate the assertion that it is unlikely that the high-mass apparatus described in Nickerson would exhibit the heating/cooling rates recited in the present claims, and that this is even less likely of when combined with the large block apparatus of Sutton. Applicants also reiterate that, while Nickerson discusses the power configuration of heaters, there is no teaching in Nickerson of the actual heating/cooling rates undergone by the mobile phase itself.

In view of the above, Applicants submit that Nickerson does not support a *prima facie* case of obviousness in combination with Sutton, because these references do not teach or suggest every element of the present claims. Withdrawal of this rejection is respectfully requested.

CONCLUSION

In light of the above, Applicant respectfully submits that pending claims 1-17 are in condition for allowance. Therefore, Applicant requests that the rejections and objections be withdrawn, and that the claims be allowed and passed to issue. If any impediment to the allowance of these claims remains after entry of this Amendment, the Examiner is strongly encouraged to call Gary Oakeson at (801) 566-6633 so that such matters may be resolved as expeditiously as possible.

The Commissioner is hereby authorized to charge any additional fee or to credit any overpayment in connection with this Amendment to Deposit Account No. 20-0100.

DATED this 10th day of June, 2008.

Respectfully submitted,


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